UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/750,294	12/30/2003	John L. Vian	BING-1-1055	9179

67820   7590   05/02/2007
ROBERT R. RICHARDSON, P.S.
P.O. BOX 2677
SILVERDALE, WA 98383-2677

EXAMINER
SHAH, SAMIR M

ART UNIT	PAPER NUMBER
2856	

MAIL DATE	DELIVERY MODE
05/02/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

		Application No.	Applicant(s)
Office Action Summary		10/750,294	VIAN ET AL.
		Examiner	Art Unit
		Samir M. Shah	2856·

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on _05 April 2007_.

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) _1-58_ is/are pending in the application.

    4a) Of the above claim(s) _32-57_ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☐ Claim(s) _1-8,10,11,13,14,16-23,25,28-31 and 58_ is/are rejected.

7) ☐ Claim(s) _9,12,15,24,26 and 27_ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☒ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on _30 December 2003_ is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some * c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _12/30/2003; 4/05/2007_.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1.   Applicant's election without traverse of claims 1-17, 18-31 and 58 in the reply

filed on 2/08/2007 is acknowledged.

Accordingly, claims 32-57 are withdrawn from consideration and claims 1-31 and

58 are examined in this Office Action.

Drawings

2.   The drawings are objected to because empty diagram boxes are impermissible

under 37 CFR §1.83(a) which recites as follows:

> *"The drawing in a nonprovisional application must show every feature of the invention
> specified in the claims. However, conventional features disclosed in the description and
> claims, where their detailed illustration is not essential for a proper understanding of the
> invention, should be illustrated in the drawing in the form of a graphical drawing symbol
> or a **labeled** representation (e.g., a **labeled** rectangular box)."*

The empty diagram boxes 704, 706, 708, 726 and 740 found in Figures 7a

- 7c of the drawings, must be labeled with an appropriate descriptive phrase in

addition to the reference legend all ready present. Appropriate correction is

required.

3.   Replacement drawing sheets including the correction are required in reply to the
Office action to avoid abandonment of the application. The objection to the drawings
will not be held in abeyance.

Specification

4.   The disclosure is objected to because of the following informalities:

(a)   As to page 7, line 23, delete "preferably" and replace it with --preferable--.

(b)   As to page 8, line 14, delete "senor" and replace it with --sensor--.

(c)   As to page 10, line 7, delete "process 400 process" and replace it with --process

400--.

(d)   As to page 10, line 11, delete "are also are" and replace it with --are also--.

(e)   As to page 13, line 12, delete "the all the" and replace it with --all the--.

(f)   As to page 18, line 19, delete "equally application" and replace it with --equally

applicable--.

Appropriate correction is required.

Claim Objections

5.   Claims 1, 2, 4, 5, 7-10, 18, 19, 22 and 58 are objected to because of the

following informalities:

(a)   As to claim 1, line 4, delete "ANNCV" and replace it with --artificial neural network

control volume (ANNCV)--.

(b)   Claim 1 recites the limitation "the neural network inverse model" in line 5 of the

claim. There is insufficient antecedent basis for this limitation in the claim.

(c)   As to claim 2, line 2, delete "locations" and replace it with --location--.

(d)   As to claims 4 and 10, line 2 and claim 5, lines 2-3, delete "an ANNCV" and

replace it with --the ANNCV--.

(e)   As to claims 7 and 8, delete "subjecting the vibrational data to a Pre-processing

Transformation consisting" and replace it with --the Pre-processing Transformation

consists--.

(f)   As to claim 9, last line, delete "also" and replace it with --which is also--.

(g)   As to claim 10, line 2 and claim 22, line 2, delete "complex domain" and replace it

with --complex frequency domain--.

(h)   As to claim 18, line 7, delete "ANNCV" and replace it with --artificial neural

network control volume (ANNCV)--.

(i)   As to claim 19, line 2, delete "computer portion" and replace it with --computer

program portion--.

(j)   As to claim 22, line 2, delete "a neural" and replace it with --the neural--.

(k)   As to claim 58, line 4, delete "ANNCV" and replace it with --artificial neural

network control volume (ANNCV)--.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

6.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7.   Claims 1-8, 10, 11, 13, 14, 16-23, 25, 28-31 and 58 are rejected under 35

U.S.C. 102(e) as being anticipated by Ferrer (US Patent 7,085,655 B2 henceforth

"Ferrer").

(a)   As to claims 1 and 58, Ferrer discloses a method of analyzing an engine

unbalance condition, comprising:

receiving vibrational data from a plurality of locations distributed over at least

one of an engine and a surrounding engine support structure (figures 1-3; column 3,

lines 37-43; column 9, lines 36-38);

inputting the vibrational data into an artificial neural network control volume

(ANNCV) (figures 1-3; column 3, lines 47-64; column 9, lines 1-52);

using a neural network inverse model, establishing a relationship between the

vibrational data from the plurality of locations and an unbalance condition of the engine

(figures 1-3; column 1, lines 20-32; column 3, lines 47-64, column 9, lines 1-52; column

11, lines 19-29); and

outputting diagnostic information from the ANNCV, the diagnostic information

indicating the unbalance condition of the engine (figures 1-3; column 10, lines 11-31,

34-39).

(b)   As to claim 2, Ferrer discloses outputting diagnostic information from the ANNCV

includes outputting at least one of an unbalance magnitude and an angular location as a

function of a rotational frequency of the engine (figures 1-3; column).

(c)   As to claim 3, Ferrer discloses the vibrational data consist of at least one

measurement of component displacement, component velocity, component

acceleration, sound pressure, and acoustic noise (figures 1-3; column 3, lines 37-43).

(d)   As to claims 4 and 5, Ferrer discloses inputting the vibrational data into an

ANNCV includes inputting the vibrational data in a time domain/complex frequency

domain format into the ANNCV (figures 1-3; column 10, lines 32-34).

(e)   As to claims 6 and 7, Ferrer discloses subjecting the vibrational data to a pre-

processing transformation/Fourier Transform (figures 1-3; column 9, lines 34-43).

(f)   As to claim 8, Ferrer discloses subjecting the vibrational data to a pre-processing

transformation consisting of Wavelet Transforms (figures 1-3; column 12, lines 4-58).

(g)   As to claim 10, Ferrer discloses inputting the vibrational data into an ANNCV

includes inputting the vibrational data in a complex frequency domain format into the

ANNCV (figures 1-3; column 10, lines 32-34).

(h)   As to claim 11, Ferrer discloses outputting diagnostic information from the

ANNCV including outputting fan/rotor unbalance and angular location data, and low

pressure turbine unbalance and angular location data (figures 1-3;column 1, lines 20-

42; column 11, lines 11-39; column 12, lines 4-59).

(i)   As to claim 13, Ferrer discloses training the neural network inverse model

(figures 1-3; column 9, lines 4-43).

(j)   As to claim 14, Ferrer discloses training the neural network inverse model

including adjusting model parameters such that application of a set of inputs and

outputs reaches a desired state of definition defined by acceptable error tolerances

(figures 1-3; column 9, lines 4-54).

(k)   As to claim 16, Ferrer discloses training the neural network inverse model

including inputting vibrational data to the ANNCV generated using an engine that is

subject to residual unbalances and to applied trial weight unbalances (figures 1-3;

column 9, lines 4-54; column 11, lines 19-29).

(l)   As to claim 17, Ferrer discloses training the neural network inverse model

including scaling the vibrational training data prior to inputting into the ANNCV (figures

1-3; column 12, line 60 - column 13, line 16).

(m)   As to claim 18, Ferrer discloses a computer program product for analyzing an

engine unbalance condition, comprising:

    a first computer program portion (for example, including 21-24) adapted to

receive vibrational data from a plurality of locations distributed over at least one of an

engine and surrounding engine support structure (figures 1-3; column 3, lines 37-43;

column 9, lines 36-38);

a second computer program portion adapted to input the vibrational data into an

artificial neural network control volume (ANNCV) (figures 1-3; column 3, lines 47-64;

column 9, lines 1-52);

a third computer program portion (15) adapted to establish a relationship

between the vibrational data from the plurality of locations and an unbalance condition

of the engine using a neural network inverse model (figures 1-3; column 1, lines 20-32;

column 3, lines 47-64, column 9, lines 1-52; column 11, lines 19-29); and

a fourth computer program portion (19) adapted to output diagnostic information

from the neural network inverse model, the diagnostic information indicating the

unbalance condition of the engine (figures 1-3; column 10, lines 11-31, 34-39).

(n)   As to claim 19, Ferrer discloses the fourth computer program portion being

further adapted to provide diagnostic information wherein the diagnostic information

indicates at least one of a quantity and a position of corrective engine balance weights

(25) needed to achieve desirable vibrational characteristics at selected aircraft

component and cabin locations (figures 1-3; column 11, lines 11-39, especially lines 24-

29).

(o)   As to claim 20, Ferrer discloses the fourth computer program portion being

adapted to output a vibrational magnitude as a function of a rotational frequency of the

engine (figures 1-3; column 10, lines 20-33).

(p)   As to claims 21 and 22, Ferrer discloses the second computer program portion

being adapted to input the vibrational data in a time domain/complex frequency domain

format into the neural network inverse model (figures 1-3; column 10, lines 15-34).

(q)   As to claim 23, Ferrer discloses at least one of the first, second, and third

computer program portions being adapted to subject the vibrational data to a Fourier

Transformation (figures 1-3; column 9, lines 34-43).

(r)   As to claim 25, Ferrer discloses at least one of the first, second, and third

computer program portions being adapted to subject the vibrational data to a Wavelet

Transformation (figures 1-3; column 12, lines 4-58).

(s)   As to claim 28, Ferrer discloses the third computer program portion being

adapted to be trained (figures 1-3; column 9, lines 1-33).

(t)   As to claim 29, Ferrer discloses the third computer program portion being

adapted to be trained including adjusting model parameters such that application of a

set of inputs and outputs reaches a desired state of definition defined by acceptable

error tolerances (figures 1-3; column 9, lines 4-54).

(u)   As to claim 30, Ferrer discloses the third computer program portion being

adapted to be trained including inputting vibrational data generated using an engine that

is subject to at least one of residual unbalances and applied trial weight unbalances

(figures 1-3; column 9, lines 4-54; column 11, lines 19-29).

(v)   As to claim 31, Ferrer discloses the third computer program portion being

adapted to be trained including scaling the vibrational training data prior to inputting into

the neural network inverse model (figures 1-3; column 12, line 60 - column 13, line 16).

Allowable Subject Matter

8.   Claims 9, 12, 15, 24, 26 and 27 are objected to as being dependent upon a

rejected base claim, but would be allowable if rewritten in independent form including all

of the limitations of the base claim and any intervening claims.
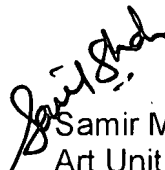
Conclusion

9.   The prior art made of record and not relied upon, cited in the attached 892 form,

is considered pertinent to applicant's disclosure.

10.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Samir M. Shah whose telephone number is (571) 272-

2671. The examiner can normally be reached on Monday-Friday 9:30 am to 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Hezron Williams can be reached on (571) 272-2208. The fax phone number

for the organization where this application or proceeding is assigned is 571-273-8300.

11.   Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Samir M. Shah
Art Unit 2856
04/20/2007

HEZRON WILLIAMS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800